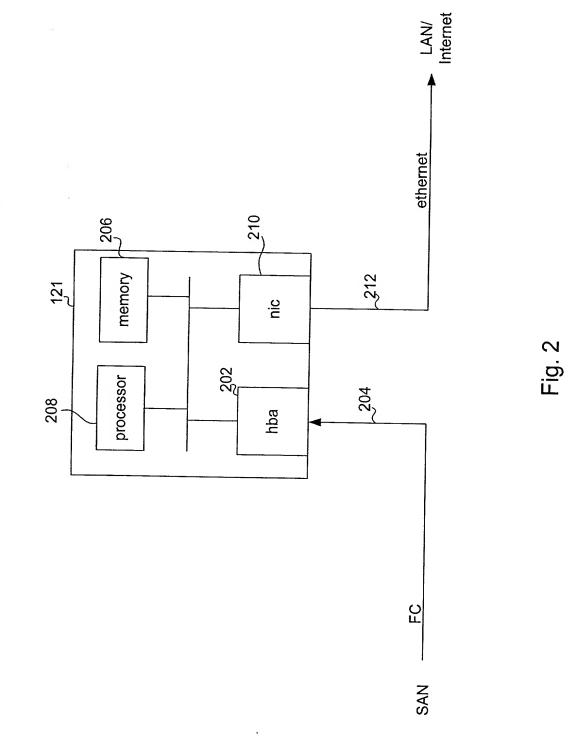
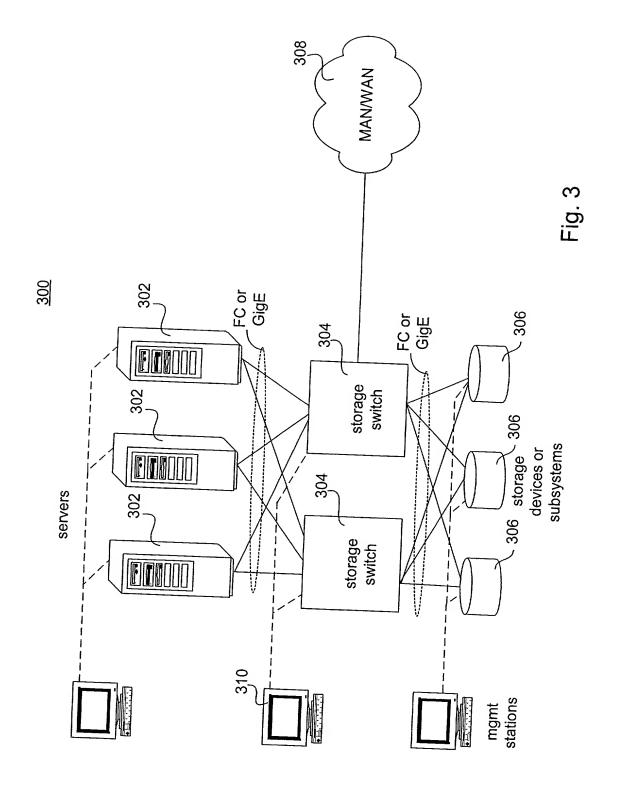


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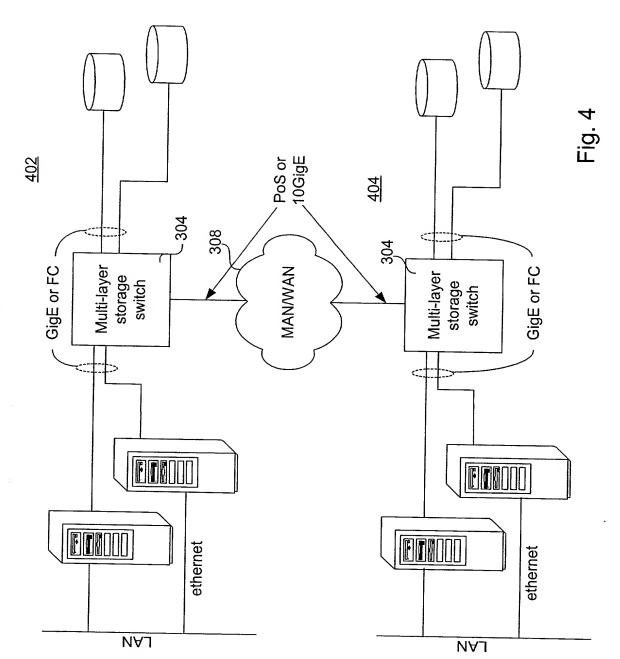
Applicant: Santosh C. Lolayekar et al.
Title: PROTOCOL TRANSLATION IN A STORAGE SYSTEM
Attorney Docket No.: MARA-01001US0 SBS
Attorney: Sarah Barone Schwartz Express Mail No.: EL670724515US



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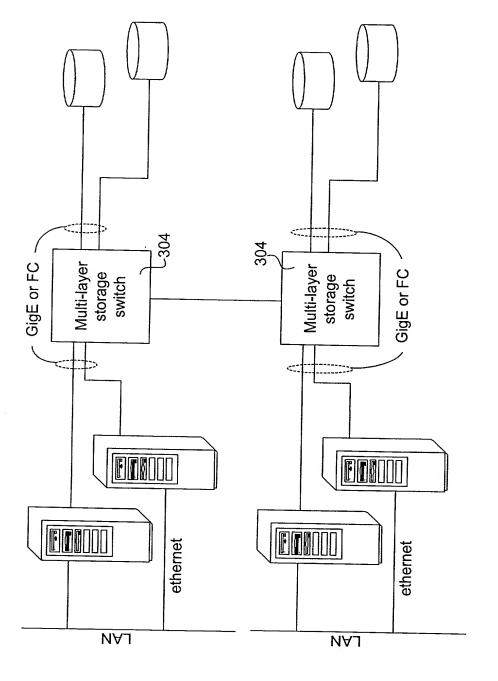


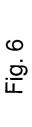
Fig. 5

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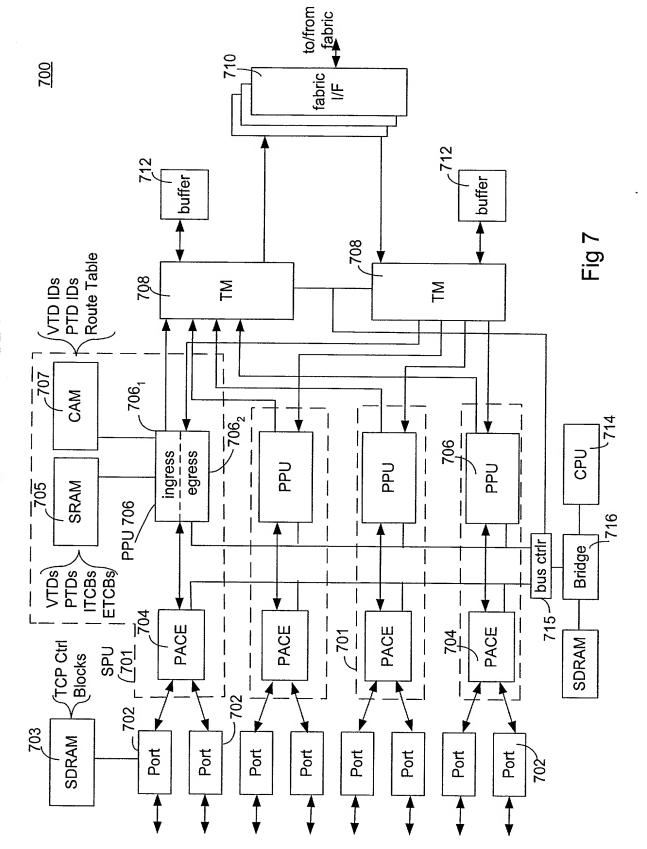
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VTD ID
FlowID
Extent Descriptors (e.g., size, location)
of outstanding commands
Max # of commands
Response time
LUN
TCP control block index
S_ID/D_ID
MaxCmdSN
Total open sequences

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Byte 0	Byte 0	Byte 1	l B	yte 2	Byte 3		
4	X I 0x01	FRW 00 ATTR		Rsvd	CRN or Rsvd		
8	TotalAHSLength	DataSegmentl	ength				
16	Logical Unit N (LUN)	Logical Unit Number (LUN)					
20	Initiator Task	Initiator Task Tag					
24	Expected Data Transfer Length						
28	CmdSN						
32							
48	SCSI Comi Descriptor Bloo						

iSCSI Command PDU Fig. 8a

Byte	Byte 0	Byte 1	1	Byte 2	1	Byte 3
4	1 1 0x31	1	Rsvd ((0)		
	Rsvd (0)					
16 20	Initiator Task T	ag			·	
20 24	Target Transfer Tag					
28	StatSN					
32	ExpCmdSN					
36	MaxCmdSN					
40	R2TSN					
44	Buffer Offset					
48	Desired Data Tr	ansfer Lengtl	n			

iscsi R2T PDU Fig. 8b

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Byte	Byte 0	Byte 1	l	Byte 2	l	Byte 3
4	0 0 0x05	F	Rsvd ((0)		
8	Rsvd (0)	DataSegme	ntLeng	th		
	LUN or Reserve	ed (0)				
16						
20	Initiator Task T	ag				
24	Target Transfer	Tag or 0xfffff	fff			
28	Rsvd (0)					
32	ExpCmdSN					
36	Rsvd (0)					
40	DataSN					
44	Buffer Offset					
48	Rsvd (0)					
40	Data					

iSCSI Write Data PDU Fig. 8c

Byte 0) l	Byte	1	Byt	e 2	Byte 3
	x25	F	ous		(0)	Status or Rsvd
	1	DataSe	gmentLe	ength		
Initiator T	ask T	ag				
Rsvd (0)						
StatSN or	Rsvd	(0)				
			-			
MaxCmdS	N					
DataSN						
Buffer Offs	set					
Residual (Count					
Data						
	1 1 0 Rsvd (0) Rsvd (0) Initiator T Rsvd (0) StatSN or ExpCmdS MaxCmdS DataSN Buffer Offs Residual 0	Rsvd (0) Rsvd (0) Initiator Task Target (0) StatSN or Rsvd ExpCmdSN MaxCmdSN DataSN Buffer Offset Residual Count	1 1 0x25 F Rsvd (0) DataSe Rsvd (0) Initiator Task Tag Rsvd (0) StatSN or Rsvd (0) ExpCmdSN MaxCmdSN DataSN Buffer Offset Residual Count	1 1 0x25 F OUS Rsvd (0) DataSegmentLet Rsvd (0) Initiator Task Tag Rsvd (0) StatSN or Rsvd (0) ExpCmdSN MaxCmdSN DataSN Buffer Offset Residual Count	1 1 0x25 F OUS Rsvd (1) Rsvd (0) DataSegmentLength Rsvd (0) Initiator Task Tag Rsvd (0) StatSN or Rsvd (0) ExpCmdSN MaxCmdSN DataSN Buffer Offset Residual Count	1 1 0x25 F OUS Rsvd (0) Rsvd (0) DataSegmentLength Rsvd (0) Initiator Task Tag Rsvd (0) StatSN or Rsvd (0) ExpCmdSN MaxCmdSN DataSN Buffer Offset Residual Count

iSCSI Read Data PDU Fig. 8d

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0	Byte 0	Byte 1	l Byte 2	Byte 3			
0 4	1 1 0x2	21 1 rsv 0 u 0 u) Status	Response			
8	Rsvd (0)	DataSegmen	Length				
	Rsvd (0)						
16							
20	Initiator Ta	sk Tag					
	Basic Resid	lual count					
24 28	Statsn						
32	I ExpCmdSN						
36	MaxCmdSN	<u> </u>					
40	ExpDataSN	or Rsvd (0)	·				
44	FxpR2TSN or Rsvd (0)						
44	Bidi-Read F	Residual Count					
	Sense Data	a and Response Da	ata (optional)				

iSCSI Response PDU Fig. 8e

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Bits	31-24	23-16	15-08	07-00
Word				
0	R_CTL		D_ID	
1	rsvd		S_ID	
2	TYPE	F_CTL		
3	SEQ_ID	DF_CTL	SEQ_CNT	
4	OX	_ID	RX_ID	
5		RLTV_OFF		

FC Frame Header Fig. 8f

Field Name	Description	Size
FCP_LUN	logical unit number	8 bytes
FCP_CNTL	control field	4 bytes
FCP_CDB	SCSI command descriptor block	16 bytes
FCP_DL	Data Length	4 bytes

FCP_CMND Payload Fig. 8g

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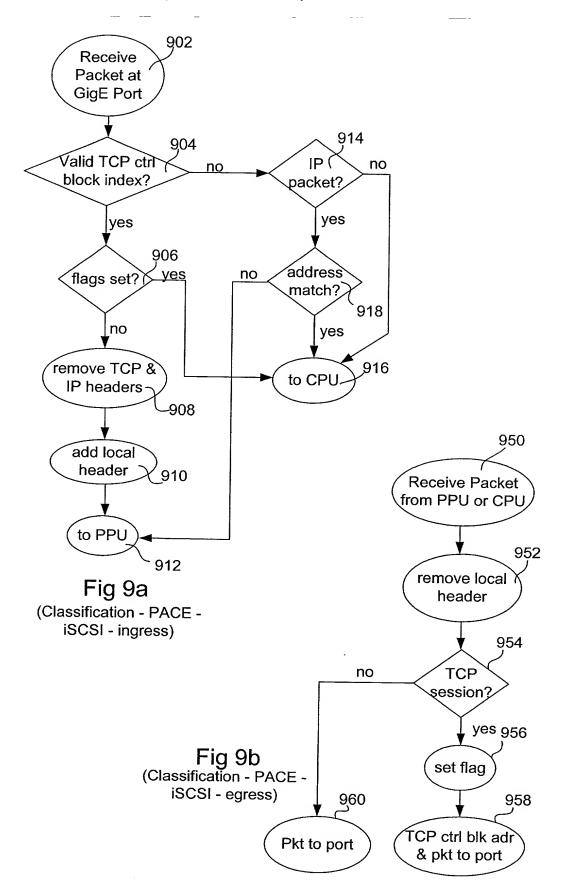
Field Name	Description	Size
DATA_RO	Relative offset of first byte of FCP_DATA IU that follows	4 bytes
BURST_LEN	length of FCP_DATA IU that follows	4 bytes
rsvd		4 bytes

FCP_XFR_RDY Payload Fig. 8h

Field Name	Description	Size
rsvd		4 bytes
rsvd		4 bytes
FCP_STATUS	field validity and SCSI status	4 bytes
FCP_RESID	residual count	4 bytes
FCP_SNS_LEN	Length of FCP_SNS_INFO field	4 bytes
FCP_RSP_LEN	Length of FCP_RSP_INFO field	4 bytes
FCP_RSP_INFO	FCP response info	m bytes
FCP_SNS_INFO	FCP sense info	n bytes

FCP_RSP Payload Fig. 8i

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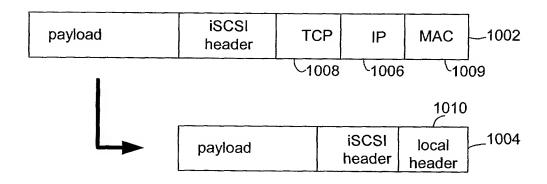


Fig. 10a

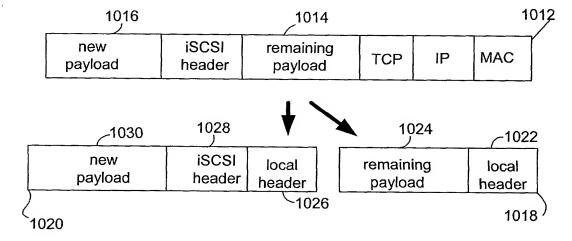


Fig. 10b

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<u>1100</u>

Local Header

VTD ID FlowID

TCP Control Block Index

Type

Size

Task Index

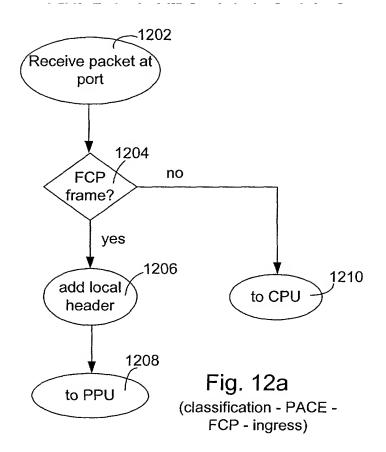
Source (Port, PACE, Linecard, CPU)

Destination (Port, PACE, Linecard,

CPU)

Fig. 11

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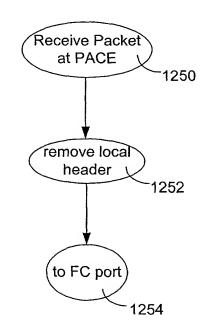
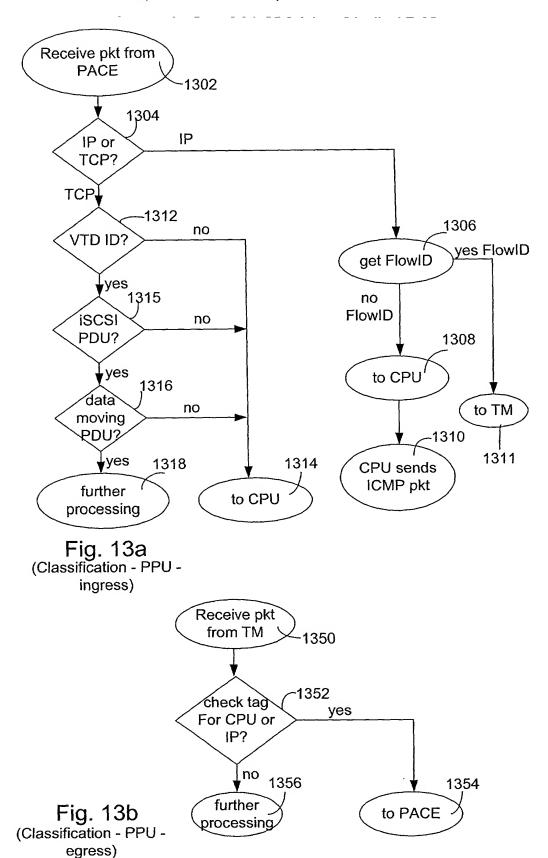


Fig. 12b (classification - PACE -FCP - egress)

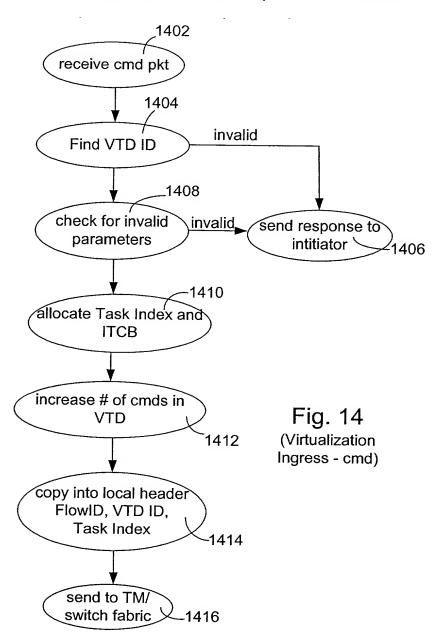
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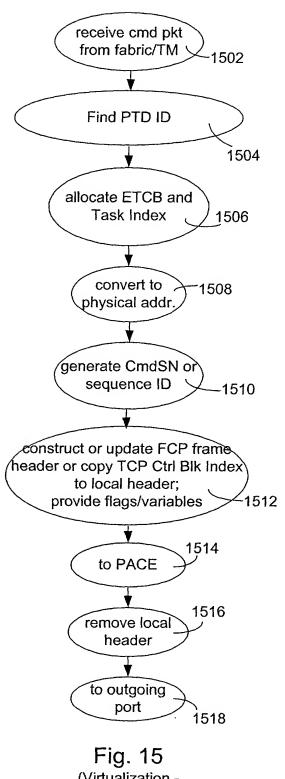
Attorney Docket No.: MARA-01001US0 SBS



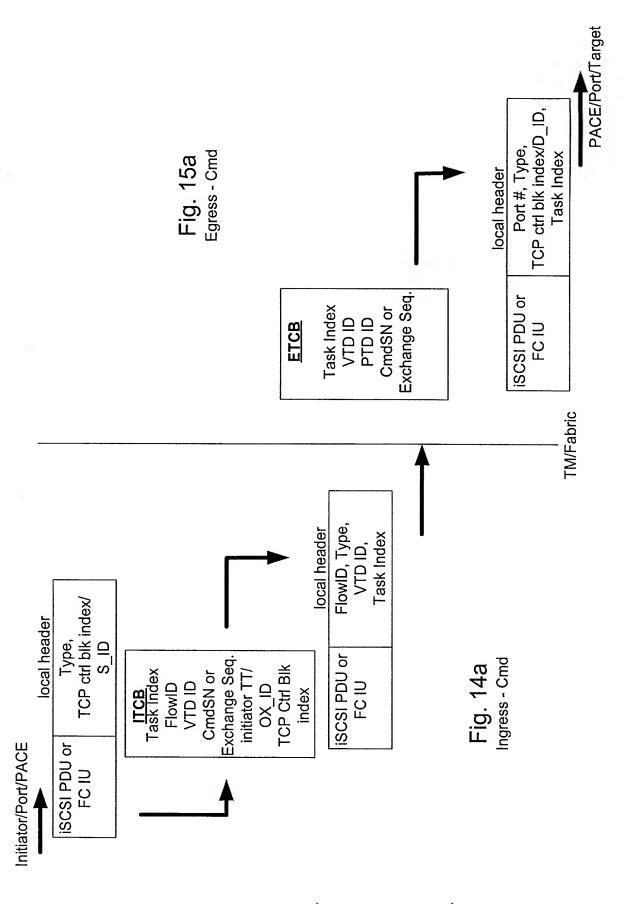
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(Virtualization - Egress - cmd)



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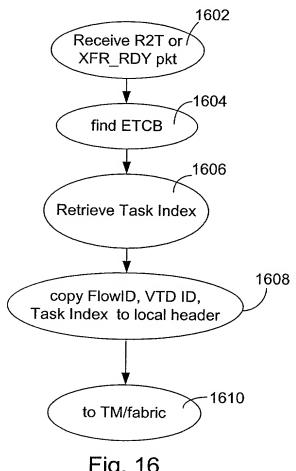
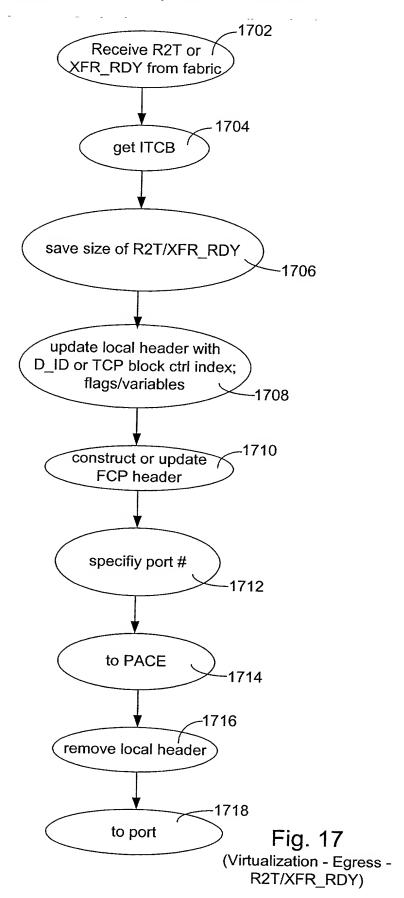


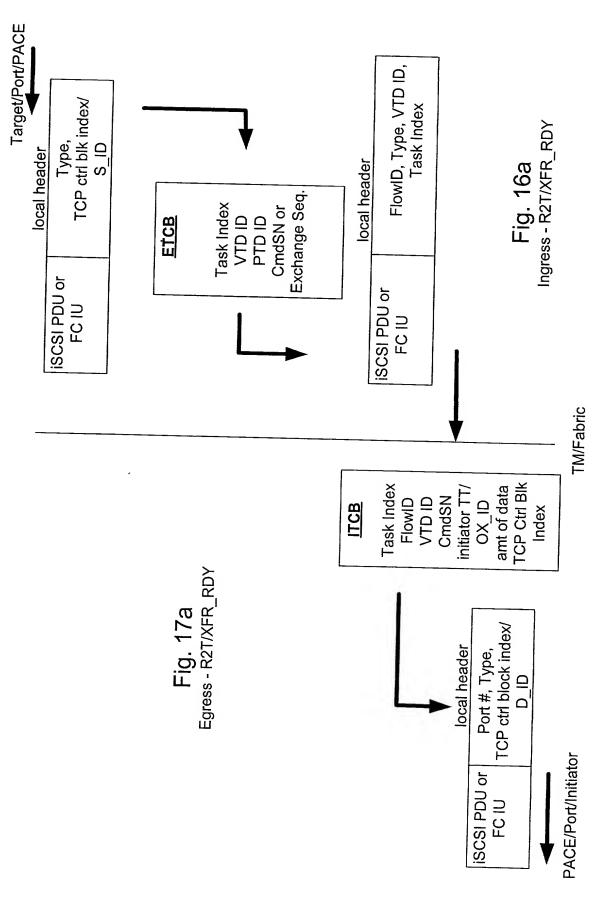
Fig. 16 (Virtualization - Ingress -R2T/XFR_RDY)

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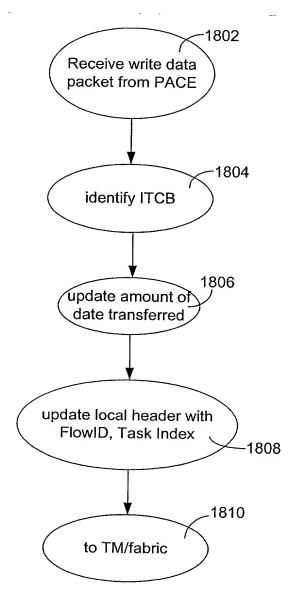


Fig. 18 (Virtualization - Ingress write data packet)

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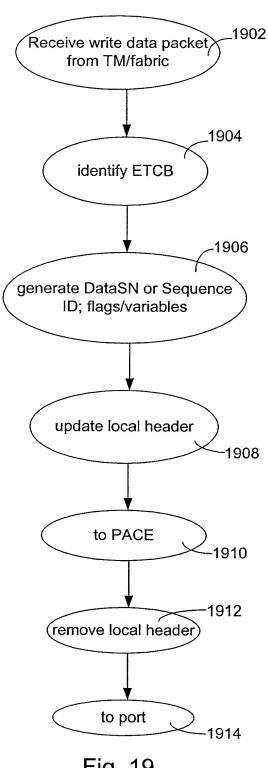
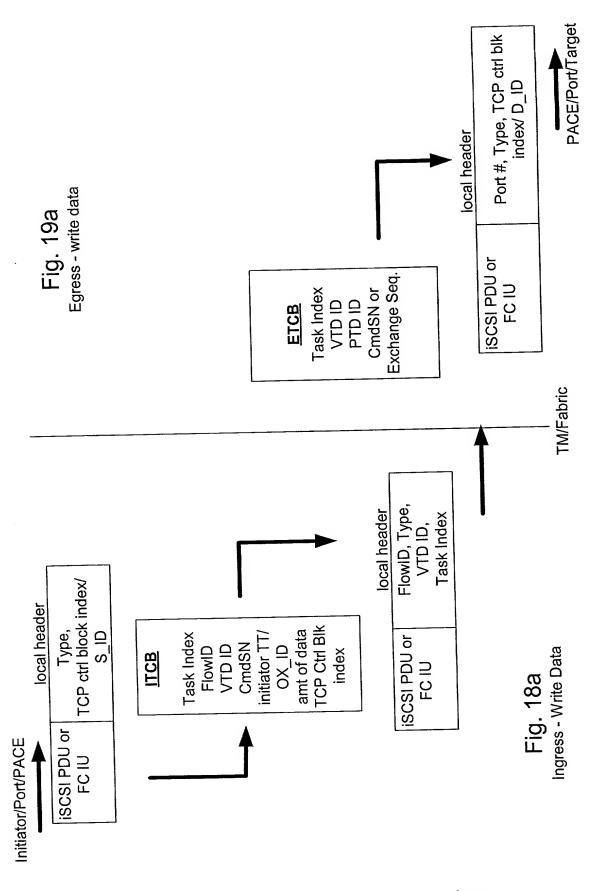


Fig. 19 (Virtualization - Egress write data pkt)



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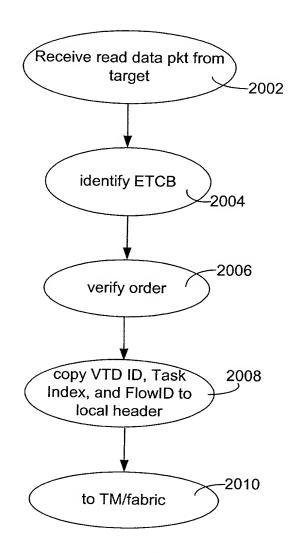
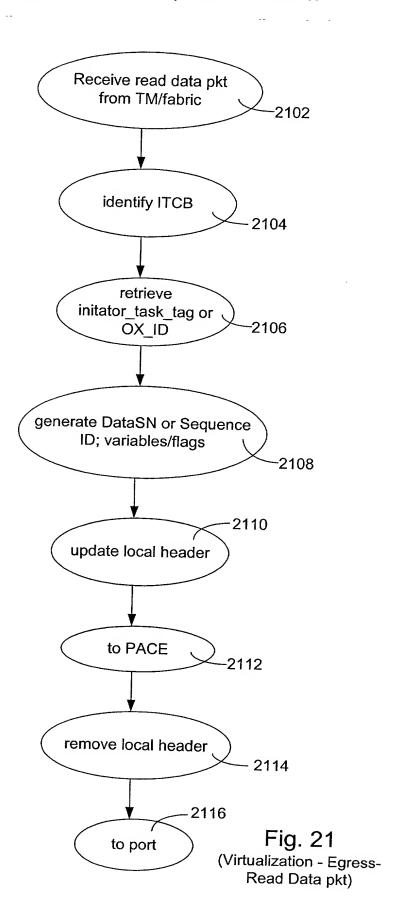


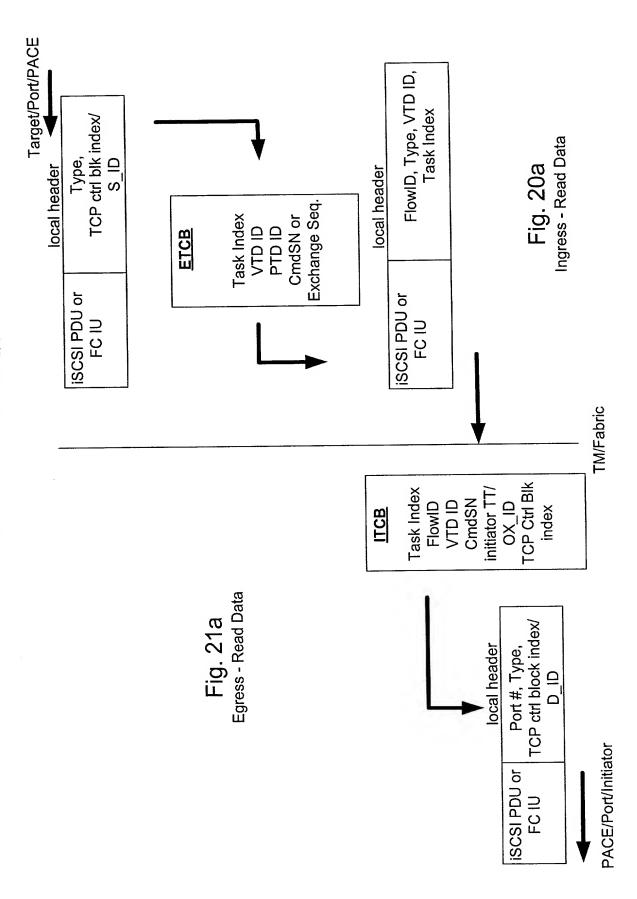
Fig. 20 (Virtualization - Ingress -Read Data pkt)

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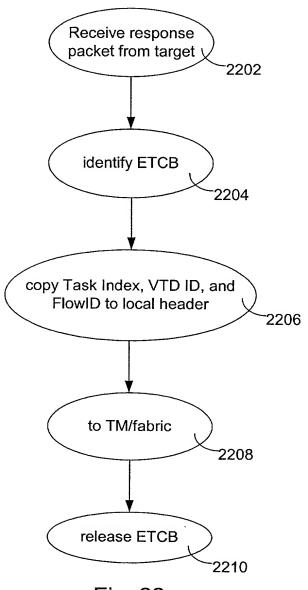
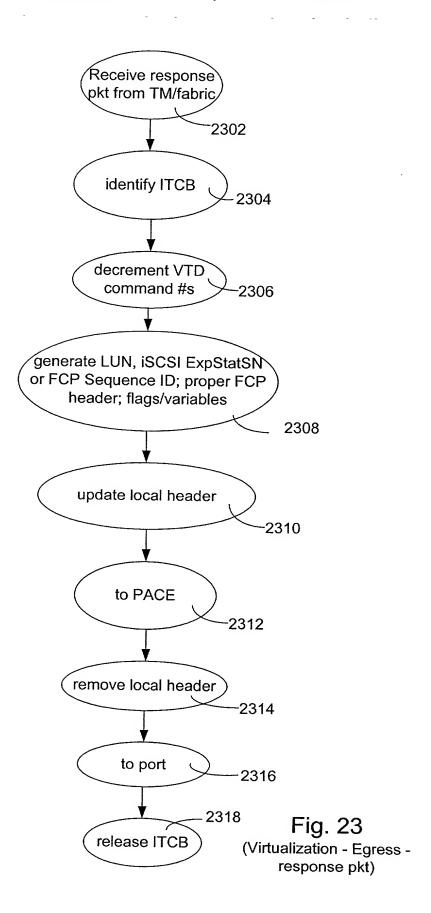


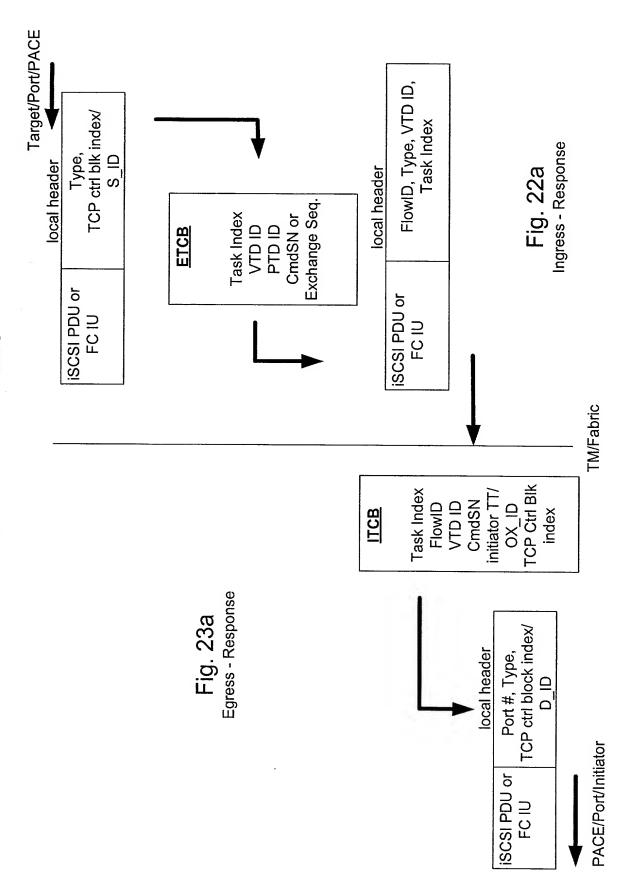
Fig. 22 (Virtualization - Ingress - response pkt)

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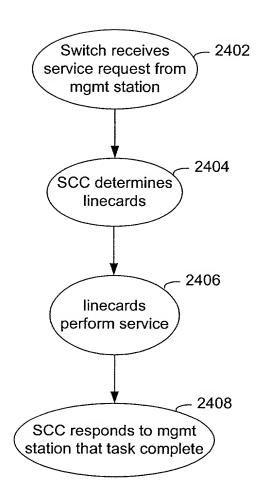
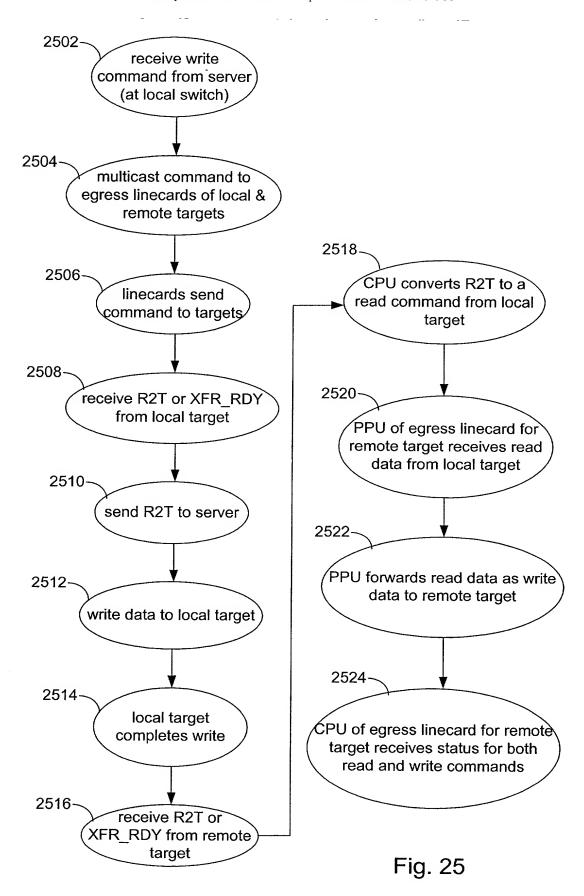


Fig.24

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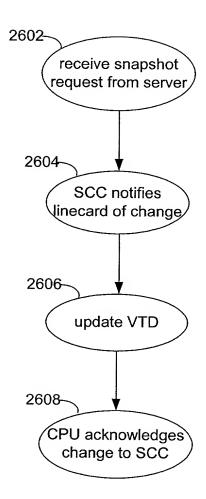
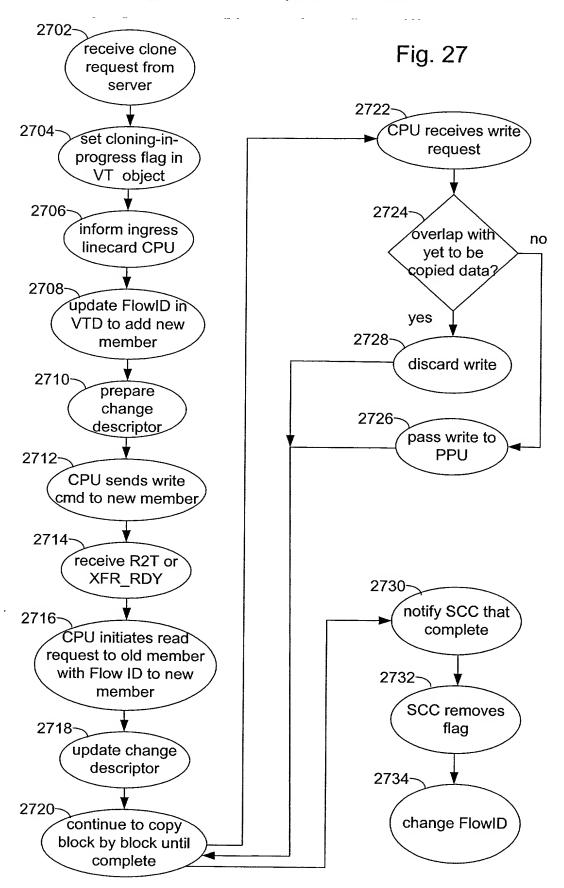


Fig. 26

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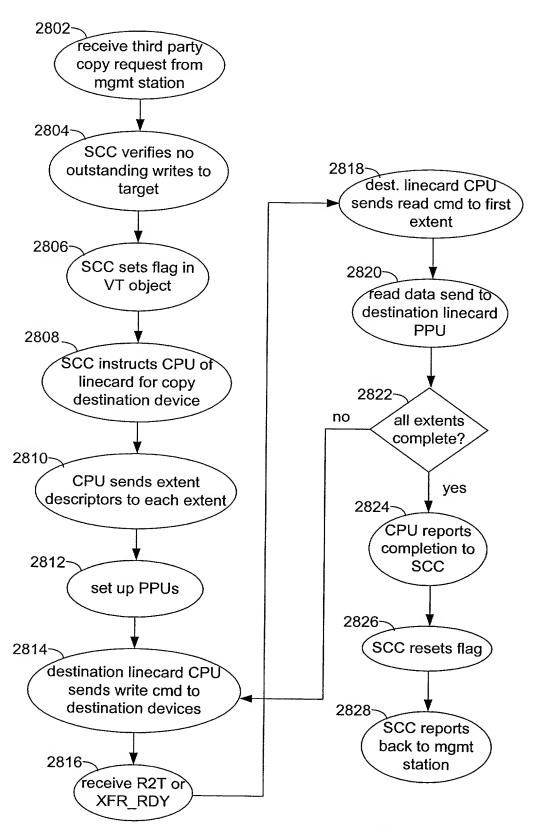


Fig. 28